AMBERJET® 1200 Na

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ENGINEERING DATA SHEET
(HCl, Co-flow regeneration)

These data provide information to calculate the sodium leakage and operating capacity of AMBERJET 1200 Na used for water demineralisation with co-flow regeneration with hydrochloric acid. The properties of AMBERJET 1200 Na are described in the Product Data Sheet PDS 0354 A.
These data are valid for Amberjet 1200 H but the results obtained refer to the Na form and must be corrected for the reversible swelling between the Na and H forms.

SODIUM LEAKAGE

The average sodium leakage is obtained by multiplying the basic leakage value from Table 1 by the correction factor A from Table 2.

$$\mathbf{Leak = Leak_0 \times A}$$

Note : Sodium leakage values are expressed as a percentage of the equivalent mineral acidity (EMA).

The value obtained in meq/L must be converted to mg/L as Na and eventually to a conductivity value, using the graph supplied in the Memento of Ion Exchange published by Rohm and Haas.

Table 1 : Basic Sodium Leakage versus HCl Regenerant Level

HCl g/L	Leakage % EMA ($Leak_0$)
50	3.9
60	3.0
70	2.5
80	2.0
100	1.5
120	1.2
150	0.9

Table 2 : Leakage Correction Factor A versus Sodium to Total Cations Ratio

Na %	Factor A
10	0.15
20	0.30
30	0.50
40	0.75
50	1.00
60	1.30
70	1.70
80	2.20
90	2.80
100	3.60

Table 3 : Suggested Operating Conditions

Maximum operating temperature	120°C
Minimum bed depth	800 mm
Service flow rate	5 to 50 BV*/h
Maximum linear velocity	60 m/h
Regenerant	HCl
Level	50 to 150 g/L
Minimum contact time	20 minutes
Concentration	4 to 10 %
Slow rinse	2 BV at regeneration flow rate
Fast rinse	1 to 3 BV at service flow rate

** 1 BV (Bed volume) = 1 m^3 solution per m^3 resin*

OPERATING CAPACITY

The operating capacity of AMBERJET 1200 Na with hydrochloric acid is obtained by multiplying the basic capacity value from table 4 by the correction factors B to E from tables 5 to 8.

$$\mathbf{Cap = Cap_0 \times B \times C \times D \times E}$$

Table 4 : Basic Capacity versus HCl Regenerant Level (co-flow regen.)

HCl g/L	Capacity eq/L (Cap_0)
50	0.93
60	1.02
70	1.10
80	1.17
90	1.23
100	1.28
120	1.37
150	1.47

Table 5 : Capacity Correction Factor B versus Sodium to Total Cations Ratio

Na %	Factor B
0	1.00
10	0.98
20	0.97
30	0.97
40	0.98
50	1.00
60	1.02
70	1.05
80	1.09
90	1.13
100	1.16

Table 6 : Capacity Correction Factor C versus Alkalinity to Total Anions Ratio

% Alk	Factor C
0	0.95
30	0.98
50	1.00
70	1.02
99	1.05

Table 7 : Capacity Correction Factor D versus Water Temperature

Temperature °C	0	50	99 % Na
5	0.97	0.95	0.92
10	0.99	0.98	0.97
15	1.00	1.00	1.00
20	1.01	1.01	1.02
25	1.01	1.03	1.04
> 30	1.02	1.04	1.06

Table 8 : Capacity Correction Factor E versus Run Length (Production Time)

Run Time (hours)	0	50	99 % Alk
5	0.96	0.98	1.00
8	0.98	1.00	1.01
10	0.99	1.00	1.01
20	1.01	1.01	1.01
> 25	1.01	1.01	1.02

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